

JANUARY

TO

DECEMBER

THE HAWAIIAN PLANTERS' RECORD

VOL. XLVIII

H. L. LYON. *Editor*

OTTO H. SWEZEY

A. J. MANGELSDORF

C. E. PEMBERTON

F. E. HANCE

W. L. McCLEERY

R. J. BORDEN

J. P. MARTIN

J. A. VERRET

Associate Editors

ORGAN OF THE EXPERIMENT STATION OF THE
HAWAIIAN SUGAR PLANTERS' ASSOCIATION

HONOLULU

1944

COPYRIGHT 1944 BY HAWAIIAN SUGAR PLANTERS' ASSOCIATION

HAWAIIAN SUGAR PLANTERS' ASSOCIATION

OFFICERS FOR 1944

J. P. COOKE	President
P. E. SPALDING	1st Vice-President
H. A. WALKER	2nd Vice-President
E. W. GREENE	Vice-President
C. B. WIGHTMAN	Secretary
S. O. HALLS	Treasurer and Assistant Secretary
W. PFLUEGER	Assistant Treasurer
G. E. SCHAEFER	Auditor

TRUSTEES FOR 1944

J. P. COOKE
P. E. SPALDING
H. A. WALKER

A. G. BUDGE
J. E. RUSSELL
G. E. SCHAEFER

EXPERIMENT STATION COMMITTEE

A. L. DEAN
W. M. BUSH
J. D. BROWN

W. W. G. MOIR, Chairman

S. L. AUSTIN
G. E. SCHAEFER
J. D. BOND

A. R. GRAMMER, Secretary

Advertiser Publishing Co., Ltd.
Honolulu, Hawaii, U S. A.

THE HAWAIIAN PLANTERS' RECORD

H. L. LYON, *Editor*

O. H. SWEZEY

C. E. PEMBERTON

W. L. McCLEERY

J. P. MARTIN

A. J. MANGELSDORF

F. E. HANCE

R. J. BORDEN

J. A. VERRET

Associate Editors

EXPERIMENT STATION STAFF

H. L. LYON, *Director*

ENTOMOLOGY

C. E. PEMBERTON, Executive Entomologist
R. C. L. PERKINS, Consulting Entomologist
O. H. SWEZEY, Consulting Entomologist
F. X. WILLIAMS, Associate Entomologist
R. H. VAN ZWALUWENBURG, Associate Entomologist
F. A. BIANCHI, Assistant Entomologist
J. S. ROSA, Laboratory Technician

PATHOLOGY

J. P. MARTIN, Pathologist
C. W. CARPENTER, Associate Pathologist
D. M. WELLER, Histologist

TECHNOLOGY

W. L. McCLEERY, Technologist
H. P. KORTSCHAK, Associate Technologist
H. A. COOK, Assistant Technologist
FRED HANSSON, Assistant Technologist
MORGAN KILBY, Assistant Technologist
L. J. RHODES, Assistant Technologist

AGRICULTURE

R. J. BORDEN, Agriculturist
J. A. VERRET, Consulting Agriculturist
R. E. DOTY, Associate Agriculturist
L. R. SMITH, Associate Agriculturist
A. Y. CHING, Field Assistant
Y. YAMASAKI, Field Assistant

CHEMISTRY

F. E. HANCE, Chemist
A. S. AYRES, Associate Chemist
F. R. VAN BROCKLIN, Associate Chemist
PAUL GOW, Associate Chemist
K. W. MCKENZIE, Assistant Chemist
Q. H. YUEN, Assistant Chemist
T. NISHIMURA, Assistant Chemist
P. B. KIM, Assistant Chemist

GENETICS

A. J. MANGELSDORF, Geneticist
A. DOI, Field Assistant
R. URATA, Field Assistant
B. K. NISHIMOTO, Field Assistant

BOTANY AND FORESTRY

H. L. LYON, Botanist and Forester
E. L. CAUM, Associate Botanist
L. W. BRYAN, Associate Forester (Hawaii)
G. A. McELDOWNEY, Associate Forester (Oahu)
COLIN POTTER, Nursery Superintendent

SPECIAL RESEARCH LABORATORIES

H. W. BRODIE, Research Associate
W. O. CLARK, Geologist
D. A. COOKE, Research Associate
CONSTANCE E. HARTT, Research Associate
A. R. LAMB, Research Associate
H. A. WADSWORTH, Collaborator in Irrigation
HOWARD COOPER, Research Assistant
A. H. CORNELISON, Research Assistant
ADA FORBES, Research Assistant
H. T. FUKUMOTO, Research Assistant
GORDON FURMIDGE, Research Assistant
J. R. LOWRIE, Research Assistant
DAVID TAKAHASHI, Research Assistant
T. TANIMOTO, Research Assistant

ISLAND REPRESENTATIVES

F. C. DENISON (Oahu)
O. H. LYMAN (Hawaii)
D. S. JUDD (Maui)
H. K. STENDER (Kauai)
WILLIAM BRANDT (Maui)

GENERAL

W. TWIGG-SMITH, Artist
J. YAMAMOTO, Assistant Artist
A. R. GRAMMER, Office Manager
F. D. KENNEDY, Bookkeeper
MABEL FRASER, Librarian
MARTHA WEBER, Assistant Librarian
WILLIAM SA NING, Superintendent of Grounds

TABLE OF CONTENTS

	PAGE
Our Field Testing Program—R. J. Borden.....	1
Elongation of Grain in Low-grade Massecuities—W. L. McCleery..	7
Cumulative Effects from Heavy Applications of Nitrogen Fertilizers—R. J. Borden.....	13
Weed-spray Studies—, R. J. Borden.....	21
The Synthesis of Sucrose in the Sugar Cane Plant—IV—Constance E. Hartt	31
The Early Development and Rate of Nutrient Uptake by Sugar Cane—R. J. Borden.....	43
Sugar Prices	58
Fusarium Disease of the Prickly Pear—C. W. Carpenter.....	59
Crop Relationships with Special Reference to Nitrogen Efficiency—R. J. Borden.....	65
Rat-Trapping Records Show Effectiveness of Control Methods—R. E. Doty.....	73
Susceptibility of Exchangeable Potassium in Hawaiian Soils to Loss by Leaching—A. S. Ayres.....	83
A Survey of Insect Pests of New Caledonia—Francis X. Williams..	93
Vegetative Differences Influence the Composition of Sugar Cane—A. H. Cornelison.....	125
In Tribute—Motojiro Sadaiki—L. W. Bryan.....	165
Sugar Prices.....	166
Why a Diversified Crops Committee, H.S.P.A.?—Harold L. Lyon..	167
Experimental Forest Planting—L. W. Bryan.....	179
Insects Carried in Transpacific Airplanes—C. E. Pemberton.....	183
Weed-spray Studies—II—R. J. Borden.....	187
Chemical Control of Hardy Weed Grasses—Francis E. Hance....	193
Nitrogen Efficiency—R. J. Borden.....	197
The Recent Introduction of Armyworm Parasites From Texas—Fred A. Bianchi.....	203
Soil and Plant Material Analyses by Rapid Chemical Methods—IV—Chemistry Department	213
Sugar Prices	231
Weed Control: Sodium Chlorate as a Herbicidal Agent in Pastures—Francis E. Hance.....	233
Leaf-punch Nitrogen Studies on First Ratoon Crop of 32-8560 at Waipio—M. Doi.....	237
The Vertical Distribution of Available (Exchangeable) Potassium in Oahu Soils—A. S. Ayres and C. K. Fujimoto.....	249
A Search for Guidance in the Nitrogen Fertilization of the Sugar Cane Crop. Part II—The First Ratoon Crop—R. J. Borden....	271
Sugar Prices.....	307

INDEX TO VOLUME XLVIII

(An asterisk preceding a page number indicates that the article is illustrated.)

A

- Activator, H.S.P.A., in chemical weed control*193, 233
 Airplanes as carriers of insects via trans-Pacific travel 183
Apanteles marginiventris (Cresson), parasite on armyworms*209
 Armyworms, parasites introduced from Texas*203
 Arthropods in New Caledonia 123
 Ayres, A. S.—
 susceptibility of exchangeable potassium in Hawaiian soils to loss by leaching the vertical distribution of available (exchangeable) potassium in Oahu soils*249

B

- Banana, pests of, in New Caledonia*99
 Bianchi, Fred A., the recent introduction of armyworm parasites from Texas*203
 Borden, R. J.—
 a search for guidance in the nitrogen fertilization of the sugar cane crop—II*271
 crop relationships with special reference to nitrogen efficiency 65
 cumulative effects from heavy applications of nitrogen fertilizers*13
 nitrogen efficiency*197
 our field-testing program 1
 the early development and rate of nutrient uptake by sugar cane*43
 weed-spray studies*21
 weed-spray studies—II*189
 Bryan, L. W.—
 experimental forest planting*179
 in tribute—Motojiro Sadaiki*165

C

- California and Hawaiian Sugar Refinery, elongation of grain in low-grade massecuites 7
 Cane—
 composition, vegetative differences*125
 crop relationships 65
 cultivation, see cultivation.
 diseases, see diseases.
 early development*43
 fertilizers, see fertilizers.
 harvesting, see harvesting.
 juices, see juices.
 moisture content in studies of composition*143
 nitrogen content*151
 nutrient uptake*43
 our field-testing program 1
 pests, see pests.
 pests of, in New Caledonia*106
 plant versus ratoons 66
 synthesis of sucrose 31
 varieties, see varieties.
 vegetative differences influence composition*125
 yields, in crop relationships 69
 Canton Island insect quarantine established. 184
 Carpenter, C. W., Fusarium disease of the prickly pear*59
Chelonus texanus (Cresson), parasite on armyworms 204
 Chemical weed spray—
 as a herbicidal agent in pastures 233
 for hardy weed grasses*193
 studies*21, *187
 Chemistry Department, soil and plant material analyses by rapid chemical methods—IV*213
 Chlorate, sodium, as a herbicidal agent in weed control193, 233

- Citrus, pests of, in New Caledonia*99
 Clements' method of crop control adapted to rapid chemical methods*213
 Coconut, pests of, in New Caledonia*101
 Coffee, pests of, in New Caledonia*21, 104
 Concentrate 40 in weed-spray studies*187
 Corn, pests of, in New Caledonia 105
 Cornelison, A. H., vegetative differences influence the composition of sugar cane*125
 Cotton, pests of, in New Caledonia 105
 Crop(s)—
 a search for guidance in nitrogen fertilization*271
 control, Clements' method adapted to R.C.M.*213
 diversified, H.S.P.A. committee*167
 emergency, in war time*167
 log form*214
 ratoon, leaf-punch nitrogen studies on 32-8560*237
 relationships, age at harvest 68
 relationships, cane and sugar yields 69
 relationships, plant versus ratoons 66
 relationships, season of harvest 68
 relationships, season of start 66
 truck, insect pests of, arrive by trans-Pacific airplanes185, 186
 truck, pests of, in New Caledonia*111
 Cultivation in our field-testing program 1

D

- Day-degrees—
 in leaf-punch nitrogen studies*238
 in nitrogen fertilization studies 298
Digitaria sp., in weed-spray studies*187
 Diseases—
 of prickly pear, first found on Kauai*59
 of sugar cane, in New Caledonia 110
 Diversified Crops Committee, H.S.P.A.*167
 Doi, M., leaf-punch nitrogen studies on first ratoon crop of 32-8560 at Waipio*237
 Doty, R. E., rat-trapping records show effectiveness of control methods*73

E

- Eleusine indica* (wire grass), in weed-spray studies*21, *187
 Experiments—
 a search for guidance in nitrogen fertilization*271
 distribution of potassium in Oahu soils*249
 early development and nutrient uptake of sugar cane*43
 forest planting on Mauna Kea, Hawaii*179
 leaf-punch nitrogen studies on 32-8560*237
 on cumulative effects from heavy applications of nitrogen fertilizers*13
 our field-testing program 1
 study of nitrogen efficiency*197
 synthesis of sucrose in sugar cane plant 31
 vegetative differences and composition of sugar cane*125
 weed-spray studies*21, *187

F

- Fertilizer(s)—
 a search for guidance in nitrogen*271
 crop relationships 65
 cumulative effects of heavy applications in studies of composition of sugar cane*13
 nutrient uptake of sugar cane*43
 our field-testing program 1
 see nitrogen.
 see potash.
 see potassium.
 Food crops of Hawaii in war time*167

Forests—

experimental planting, on Mauna Kea, Hawaii	*179
in tribute—Motojiro Sadaiki	*165
insect pests, in New Caledonia	*118
of New Caledonia	*93
Fujimoto, C. K., the vertical distribution of available (exchangeable) potassium in Oahu soils	*249
Fusarium disease of prickly pear	*59

G

Grain, needle, in low-grade massecuites	7
Grasses—	
chemical control	*193, 233
pests of, in New Caledonia	106

H

Hance, Francis E.—	
chemical control of hardy weed grasses, soil and plant material analyses by rapid chemical methods—IV	*193
weed control; sodium chlorate as a herbicidal agent in pastures	233
Hartt, Constance E., the synthesis of sucrose in the sugar cane plant—IV	31
Harvesting—	
age, in crop relationships	68
in our field-testing program	1
season of, in crop relationships	68
Hawaiian Sugar Planters' Association—	
activator in chemical weed control	*193, 233
diversified crops committee	*167

I

Index—	
nitrogen, by R.C.M.	218
nitrogen, in leaf-punch studies	*237
phosphorus, by R.C.M.	224
potassium, by R.C.M.	221
primary (total sugars), by R.C.M.	218
Insects—	
carried in transpacific airplanes	183
miscellaneous, in New Caledonia	*115
pests, survey of, in New Caledonia	*93
see parasites.	
see pests.	
see predators.	
Irrigation—	
in our field-testing program	1
in leaf-punch nitrogen studies	*238
in studies of composition of sugar cane	127

J

Juices, cane—	
annual synopsis of mill data—1943 (Cir. No. 82)	
conductivity of, in studies of composition of sugar cane	*141
in studies of composition of sugar cane	*137

L

<i>Laphygma exempta</i> (Walker), common armyworm in Hawaii	*203
Leaching, loss of potassium in soils by	*83
Leaf-punch nitrogen studies with 32-8560	*237
Lyon, Harold L., why a diversified crops committee, H.S.P.A.?	*167

M

Massecuites, elongation of grain in low-grade Mauna Kea, Hawaii, experimental forest planting	*179
McCleery, W. L., elongation of grain in low-grade massecuites	7
<i>Meteorus laphygmae</i> Viereck, parasite on armyworms	*206
Midway Islands insect quarantine established	184
Moisture content of sugar cane in studies of composition	*143
Mortality, in studies of composition of sugar cane	*137
Mosquitoes, carried in transpacific airplanes	183, 186

N

Needle grain in low-grade massecuites	7
<i>Neopristomerus appalachianus</i> Viereck, parasite on armyworms	205
New Caledonia, a survey of insect pests	*93
Nitrogen—	
a search for guidance in fertilization	*271
content of sugar cane	*151
cumulative effects from heavy applications	*13
efficiency in crop relationships	65
index by R.C.M.	218
index in leaf-punch studies	*237
our field-testing program	1
rate of uptake by sugar cane plant	*43
recovery	201
see fertilizers.	
studies, leaf-punch, on 32-8560	*237
study of efficiency	*197

O

<i>Opuntia megacantha</i> , the common prickly pear, Fusarium disease of	*59
--	-----

P

Pan American Airways, in connection with quarantine work in transpacific airplanes	183
Parasites—	
<i>Apanteles marginiventris</i> (Cresson) on armyworms	*209
armyworm, introduced from Texas	*203
<i>Chelonius texanus</i> (Cresson) on armyworms	204
in New Caledonia	*93
<i>Meteorus laphygmae</i> Viereck on armyworms	*206
<i>Neopristomerus appalachianus</i> Viereck on armyworms	205
<i>Perisierola</i> sp. on armyworms	205
<i>Rogas laphygma</i> Viereck on armyworms	209
Pear, common prickly, disease of	*59
Pemberton, C. E., insects carried in transpacific airplanes	183
<i>Perisierola</i> sp., parasite on armyworms	205
Pests—	
armyworms, parasites introduced from Texas	*203
carried in transpacific airplanes	185, 186
insect, survey of, in New Caledonia	*93
<i>Laphygma exempta</i> (Walker), armyworm in Hawaii	*203
Phosphate—	
rate of uptake by sugar cane plant	*43
see fertilizers.	
Phosphorous index, by R.C.M.	224
Plant—	
cane versus ratoons	66
material analyses by rapid chemical methods	*213
Potash—	
rate of uptake by sugar cane plant	*43
see fertilizers.	
Potassium—	
index, by R.C.M.	221
loss by leaching in Hawaiian soils	*83
vertical distribution in Oahu soils	*249
Prebaited feeding-station station method	*73
trapping records show effectiveness of	*93
Predators, in New Caledonia	*93
Prices of sugar:	
Sept. 16, 1943 - Dec. 15, 1943	58
Dec. 16, 1943 - Mar. 15, 1944	166
Mar. 16, 1944 - June 15, 1944	231
June 16, 1944 - Sept. 15, 1944	307
Primary index (total sugars), by R.C.M.	218
Program of field testing	1

Q

Quarantine—	
in connection with transpacific airplanes	183
stations at Midway and Canton islands	184

R

Rainfall, in leaf-punch nitrogen studies	*238
Rapid chemical methods—	
nitrogen index by	218
of soil and plant material analyses—IV	*213
phosphorus index by	224

potassium index by.....	221
primary index (total sugars) by.....	218
Ratoons—	
a search for guidance in nitrogen fertilization of.....	*271
crop, leaf-punch nitrogen studies on.....	*237
versus plant	66
Rats—	
population at Kauai Variety Station....	*74
seasonal fluctuation	78
trapping records show effectiveness of control methods	*73
Rice, pests of, in New Caledonia.....	106
<i>Rogas laphygma</i> Viereck, parasite on armyworms	209

S

Sadaiki, Motojiro, in tribute.....	*165
Season—	
of fluctuation in rat population.....	78
of harvest, in crop relationships.....	68
of start, in crop relationships.....	66
Sodium chlorate as a herbicidal agent in weed control	193, 233
Soil(s)—	
analyses of rapid chemical methods....	*213
cumulative effects from heavy applications of nitrogen fertilizers.....	*13
distribution of potassium in (Oahu)....	*249
loss of potassium by leaching.....	*83
Spiders, in New Caledonia.....	*123
Sucrose—	
in studies of the composition of the sugar cane plant.....	*147
the synthesis of, in the sugar cane plant	31
Sugar—	
cane, see cane.	
grain, in low-grade massecuites.....	7
reducing, in studies of composition of sugar cane	*145
prices	58, 166, 231, 307
yields in crop relationships.....	69
yields, see annual synopsis of mill data—1943 (Cir. No. 82).	
Synthesis of sucrose in the sugar cane plant	31

T

Taro, pests of, in New Caledonia.....	*110
Termites or white ants, in New Caledonia..	115
Texas, introduction of armyworm parasites from	*203
Traps, rat, records show effectiveness of control methods	*73
Truck crops, pests of, in New Caledonia....	*111

V

Varieties of sugar cane—	
see annual synopsis of mill data—1943 (Cir. No. 82).	
32-8560 in leaf-punch nitrogen studies	*237
32-8560 in nitrogen fertilization study.	*271

W

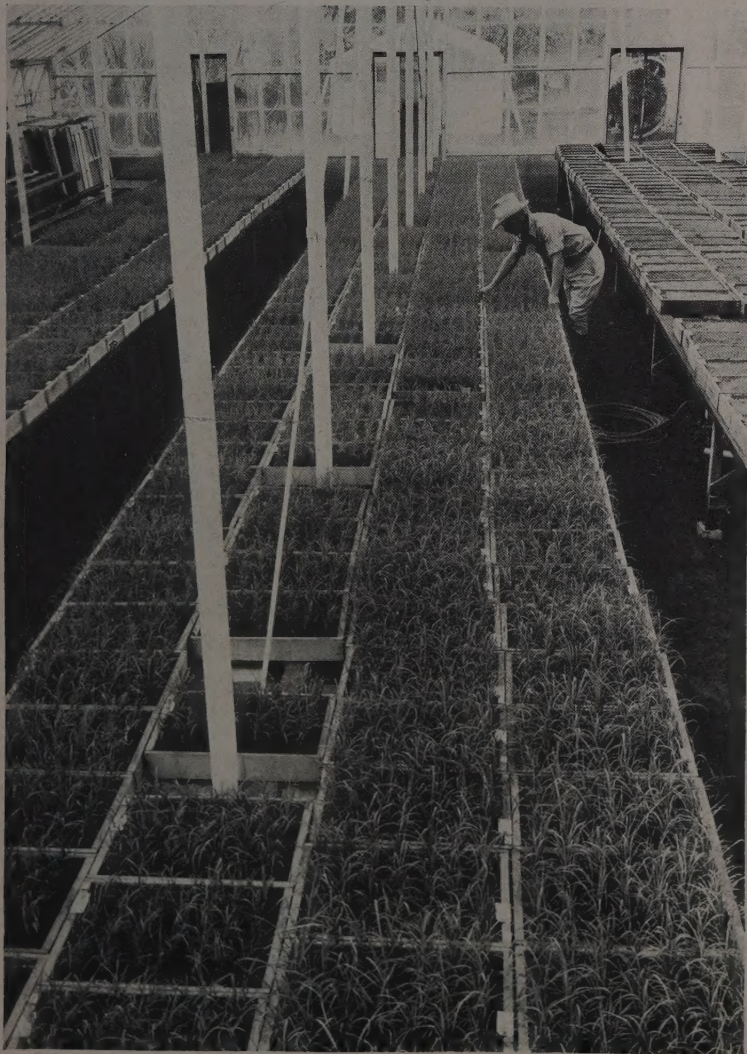
Weather—	
in leaf-punch nitrogen studies.....	*238
in nitrogen fertilization studies.....	296
Weed control—	
concentrate 40	*21
of hardy grasses by chemicals.....	*193
our field-testing program.....	1
sodium chlorate as a herbicidal agent....	233
weed-spray studies	*21, *187
Williams, Francis X., a survey of insect pests of New Caledonia.....	*93
Wire grass, <i>Eleusine indica</i> in weed-spray studies	*21, *187

Y

Yields—	
cane and sugar, in crop relationships..	69
see annual synopsis of mill data—1943 (Cir. No. 82).	

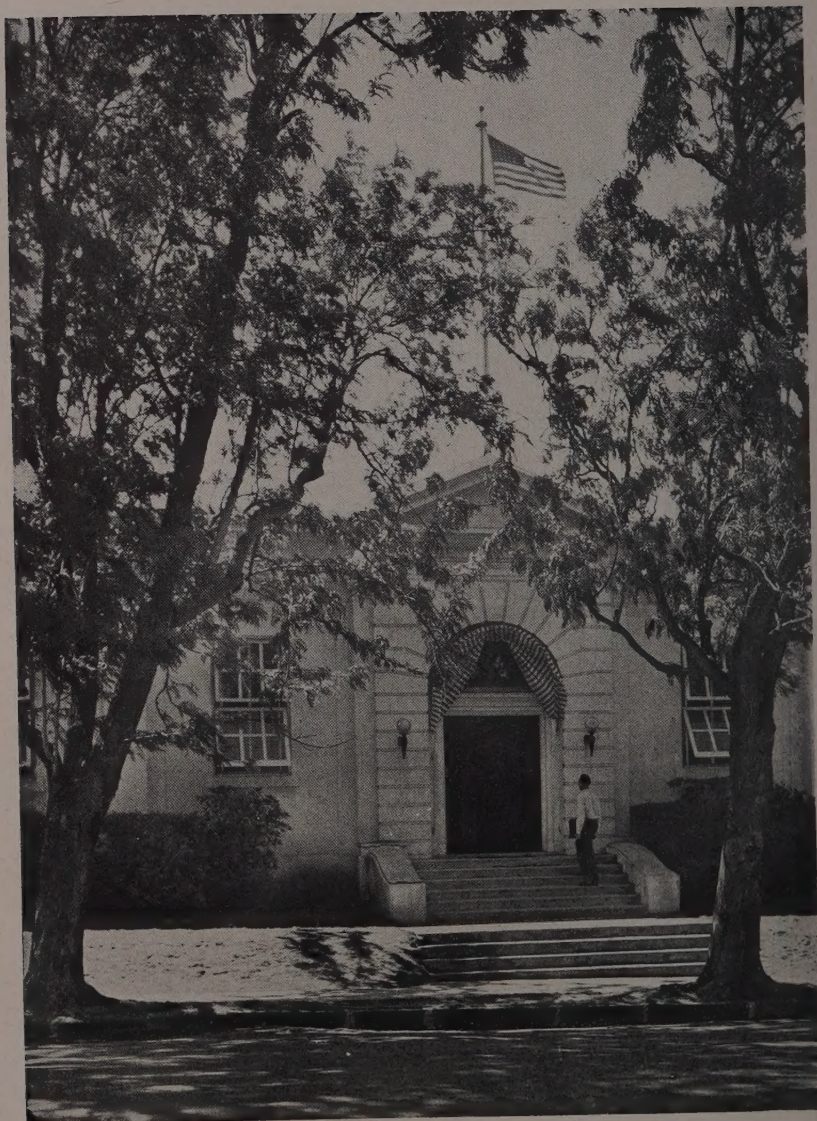
ILLUSTRATIONS APPEARING ON THE COVERS OF
VOLUME XLVIII

FIRST QUARTER



Sugar cane seedlings of the "44" series in the Makiki greenhouse. Twelve years ago 32-8560 was germinated in this greenhouse—it now occupies 97,000 acres.

SECOND QUARTER



THIRD QUARTER



Dr. O. H. Swezey, Consulting Entomologist, who on August 12, 1944, completed forty years of invaluable entomological service to the H.S.P.A. and the Territory as a whole. His work has gained wide recognition not only in Hawaii and on the mainland, but also amongst entomologists all over the world. Today his contributions to the science of entomology continue with unchanged quality and volume.

FOURTH QUARTER



H 32-8560

